

EFFICACY OF COACHING PROGRAM ON NURSES' PERFORMANCE REGARDING CARING OF PATIENTS UNDERGOING CARDIAC CATHETERIZATION

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Background: With patients having cardiac catheterization, nurses play a range of responsibilities and perform several tasks. Nursing care is given to a patient before, during, and following a cardiac catheterization operation. One of the most effective ways to support nurses' personal and professional development is coaching. **Aim:** To evaluate the efficacy of the coaching program on nurses' performance regarding caring of patients undergoing cardiac catheterization. **Method:** Quasi-experimental research design was used to achieve the aim of this study. **Setting:** This study was carried out at the cardiac catheterization unit at Fayoum University Hospital. **Sample:** A convenient sample of all available nurses (50) worked at the previously mentioned setting. **Tools of data collection:** Four tools were used; **Tool (I):** Structured interviewing questionnaire consisted of two parts: **Part (1):** Sociodemographic characteristics of the studied nurses. **Part (2):** Nurses' knowledge questionnaire, **Tool (II):** Nurses' Attitude Scale, **Tool (III):** Observational checklist and **Tool (IV):** Coaching Practice Rating Scale, used by the nurses as a self-evaluation instrument to reveal the degree to which their coaching practices. **Results:** According to the findings of the current study, more than two third of the studied nurses had a good attitudes toward caring of patients undergoing cardiac catheterization, while less than two third of them had satisfactory levels of knowledge's and practices (58% and 60%) respectively. Additionally, there was a statistically significant association between the overall scores for nurses' knowledge, attitude, and practice (p.001). **Conclusion:** The coaching program improved nurses' performance concerning care of patients undergoing cardiac catheterization and improved their coaching skills. **Recommendations:** The coaching program for nurses should be applied continuously to help them become better coaches and professionals when caring of patients having cardiac catheterization. **Keywords:** Coaching Program Nurses' Performance Patients Cardiac Catheterization

Introduction

Cardiac catheterization is among the most well-known and popular invasive procedures that can be performed to assess coronary artery circulations and ascertain the condition of the heart when blood

is pumped into the chambers by the insertion of a catheter. Heart diseases like arrhythmias, angina, and issues with the cardiac valves can all be diagnosed and treated by cardiac catheterization. The diagnosis or treatment of coronary artery disease, congenital heart disease, heart failure, and micro vascular heart disease may involve cardiac catheterization (**Elnagar et al., 2020**).

Cardiac catheterization is a procedure in which a thin, flexible tube (catheter) is guided through a blood vessel to the heart to diagnose or treat certain heart conditions, such as clogged arteries or irregular heartbeats. A cardiac catheterization gives doctors important information about the heart muscle, valves, and blood vessels (**Tangiisuran et al., 2017**). During cardiac catheterization, doctors can do different heart tests, deliver treatments, or remove different cardiac cells for examination. Some heart disease treatments such as coronary angioplasty and coronary stenting are done using cardiac catheterization (**Aziz & Pary, 2021**). Cardiac catheterization is typically an elective treatment where a heart disease patient who is asymptomatic follows a hospital admission process. The main health issue impacting persons of working age is coronary artery disease (CAD), the most prevalent form of heart disease (**Joyce et al., 2017**).

To identify and treat individuals with vascular disorders, more than 1,115,000 angiograms were carried out in the USA in 2006 (**Mauro, 2014**). Heart disorders caused 616,000 deaths globally in 2007—one-fourth of all fatalities. Coronary heart disease claimed the lives of 405,309 persons in 2008. A coronary event will occur in the USA about every 25 seconds, and CAD deaths will occur about once every minute (**Narayanasamy & Penney, 2014**).

In a time of increased competition in the healthcare industry, the role of the professional nurse in the patient's care while undergoing cardiac catheterization is advantageous for ensuring a favorable outcome for the patient (**Mohammed & Elsis 2018**). Because outpatient heart catheterizations are becoming more common, nurses are essential to patient assessment, safety, support, and education. To provide the best care possible, nurses must thoroughly prepare the patient on an emotional and physical level. To prevent difficulties and guarantee positive results, proper assessment and monitoring must be carried out before, during, and after catheterization (**Elnagar et al., 2020**).

Lack of training and experience within the cardiac catheterization team, which includes cardiologists, radiologists, and nurses, might result in unanticipated cardiac surgery and even mortality from complications during the procedure. Nurses who can quickly recognize indications and difficulties are in a prime position to initiate crucial action and enhance outcomes (**Gorka et al., 2019**).

Cardiac catheterization had several complications, including the following: infection, injury, and pain at the IV or sheath insertion site, blood clots, and harming urinary organs may occur because of the distinction dye that is frequently seen in kidney disease and patients with diabetes mellitus (**Kern, 2011**).

Assessment of vascular problems and upholding homeostasis at the puncture site are the nurse's primary post-procedure objectives. Before undergoing cardiac catheterization, the nurse should thoroughly analyze each patient to determine how to achieve homeostasis at the site of the arteriotomy incision. She should also monitor the patient's vital signs carefully. By applying physical pressure for 10 minutes and using mechanical compression or a pressure dressing in the groin area, a nurse may be able to stop any seeping (**Omran, 2010**).

Providing nursing care to patients having cardiac catheterization is one of the main responsibilities of nurses working in cardiac catheterization units, who have a particular function and are highly skilled cardiovascular nurses. Nurses provide care for patients before, during, and after any treatment, such as cardiac catheterization, and they have various tasks and responsibilities linked to the care of such patients (Vera, 2014). The first step of responsibilities begins during preadmission and ends with discharge composed of, screening health, and preparation of patients before the surgery, and assistants to surgeons during the surgical procedure, monitoring of patients after the surgery until discharge (**Joyce et al., 2017**).

The majority of studies have stated that nurses should take a training course in cardiac catheterization to advance their knowledge and give them the chance to finish graduate studies (**Hassan & Aburaghif., 2016**). Coaching is one of the few choices available to help promote the development of deliberate professional development (**Mohamed & Elsisi., 2018**).

This method offers support to those who want to realize their full potential, set goals and ways to achieve them, as well as advance their knowledge and abilities (**International Coach Federation., 2018**). Nurses who participate in coaching can strengthen their existing knowledge and advance the acquisition of new skills. The atmosphere in that learners acquire knowledge and abilities thanks to coaches is one of support and encouragement. It is something that nurses may use to advance in their careers and enjoy their work more. Organizations continue to explore strategies for retaining senior nurses, giving junior nurses opportunities, and offering all nurses support and useful help (**Elnagar et al., 2020**).

Significant of the study:

The nurses working in cardiology care units must not only give the patients the finest treatment possible. Coaching offers the chance to intentionally organize nurses' professional development based on their own their needs and expectations (**Lee & Oh, 2018**). Heart failure (0.8%), myocardial infarction (2.2%), vascular complications (2.2%), arrhythmias (1.8%), heart failure (0.8%), and other complications were reported as cardiac catheterization complications in Egypt in 2010. These complications were in addition to the uncomfortable experience for the patients. Because of this, providing care for patients undergoing cardiac catheterization requires nurses to have the expertise, understand the types of issues that are likely to arise, and have evaluation skills to help prevent complications (**Omran, 2010**).

Additionally, nurses that work in cardiac catheterization facilities are essential in managing patients who are having cardiac catheterizations. Because of subpar nursing care, patients undergoing cardiac catheterization frequently experience problems such as infection, bleeding, hematomas, and thrombosis. Therefore, it is crucial to evaluate the performance of nurses concerning the treatment of patients having cardiac catheterization. By offering thorough education and training program, nurses can better the quality of treatment by identifying the problems and fixing them in the future. According to the most recent WHO statistics, which were published in April 2011, coronary heart disease deaths in Egypt totaled 78,897 (21.73%) of all fatalities (Yassin, 2014).

Aim of the study

The study aimed to evaluate the efficacy of the coaching program on nurses' performance regarding caring of patients undergoing cardiac catheterization. This aim achieved through

- Assess nurses' knowledge's regarding the care of patients undergoing cardiac catheterization.
- Assess nurses' attitudes regarding the care of patients undergoing cardiac catheterization.
- Assess nurses' practices regarding the care of patients undergoing cardiac catheterization.

Research hypotheses

1. After participating in coaching program sessions, studied nurses knowledge's, attitudes and practices score in post coaching program test will higher than in pretest.
2. There will be a relation between knowledge's attitudes and practices regarding caring of patients undergoing to cardiac catheterization.

Subject & Methods

Research design:

The quasi-experimental with pre-posttest research design was used to achieve the aim of the current study.

Setting:

This study was carried out at the cardiac catheterization unit at Fayoum University Hospital.

Sample:

- A convenient sample of all available nurses (50) worked at the previously mentioned setting. They recruited based on the following criteria; both genders, having at least 6 months of experience in cardiology units and agree to participated in the study.

Tools of data collection:

Four tools were used; **Tool I: Structured interviewing questionnaire:** The tool adopted from (Omran, 2010). It was used to assess nurses' knowledge's regarding the care of patients undergoing cardiac catheterization, and it consisted of two parts:

- **Part (1):** Sociodemographic characteristics of studied nurses: age, , sex, age, level of education, years of experience, attending training courses regarding cardiac catheterization, number of training courses and presence of protocol in cardiac catheterization unit.
- **Part (2): Nurses' knowledge questionnaire:** It contained 15 closed-ended questions in the form of multiple-choice questions, including those about the definition, goal, investigations, risks, and safety precautions of cardiac catheterization, patient preparation, and nursing care of patients having cardiac catheterization.
- Additionally, incorporate 47 true-or-false questions that are separated into the following categories: There are 13 items nurses' knowledge's about and patient care pre cardiac catheterization. Twelve items in the nurses' knowledge base about patient care during cardiac catheterization. There are (14) items on the nurses' knowledge list for post-cardiac catheterization patient care. There are (8) items regarding health education of patients' undergoing cardiac catheterization.

Scoring System for knowledge:

- Nurses' answers scored on correct answer take one mark and incorrect answer takes zero. The total score is categorized as satisfactory for a total grade of equal or more than 75% and unsatisfactory for a total grade of less than 75% (**Eldosoky, 2004 & Kasem, 2016**)

Tool II: Nurses' Attitude Scale: Scale to assess nurses' attitudes:

It was conducted by researchers after consideration of relevant literature (**Kasem, 2016**). Previously, it was used to assess nurses' attitudes toward caring for patients undergoing cardiac catheterization. The questionnaire contained ten closed-ended items, such as "Cardiac catheterization is essential for cardiac patients, Training on cardiac catheterization is essential for behavioral change,.

Attitude Score: According to a three-point scoring system, agree = 2, uncertain = 1, and disagree = 0. The total score is defined as positive when the final grade is equal to or more than 75%; it is classified as negative when the final grade is less than 75% (**Eldosoky, 2004 Kasem, 2016**).

Tool (III) Observational checklist: To evaluate nurses' practices regarding the caring of patients undergoing cardiac catheterization, this tool was adapted from (**Omran, 2010, Williams, and Wilkins, 2011**). It was divided into the following sections:

- Nurses practices before cardiac catheterization (9) items.
- Nurses practices during cardiac catheterization (3) items.
- Nurses' practice after cardiac catheterization (6) items.
- Nursing practices pre discharge orders (4) items.

Scoring system of practice:-

- The following formula is used to calculate the practice scoring system: Scores are based on two points (done correctly = 2, not done = 1, not applicable = 0). The total score is

classified as satisfactory for a total grade of at least 75% and unsatisfactory for a total grade of less than 75%. (Eldosoky, 2004 and Kasem, 2016).

Tool (IV): Coaching practices rating scale, used by the nurses as a self-evaluation instrument to reveal the degree to which their coaching practices. The coaching practices rating scale is used by nursing professionals as a tool for self-evaluation to see how closely their coaching practices match the coaching characteristics. It is an adaptation of (Rush & Shelden., 2006). The scale has 14 statements, including acknowledging the learner's current knowledge and skills as a foundation for improving that knowledge and skills, working with the learner to identify desirable skills and a timeline for the coaching process, and developing with the learner an action/motor plan necessary to achieve the desired ability after each coaching session.

The scoring system as the following: No opportunity to measure (0), None of the Time (1), Some of the Time (2), About Half of the Time (3), Most of the Time (4), and Always (5). There were two categories based on the total score, which varied from 14 to 70: the degree of competence if greater than 65% and the level of incompetence if less than 65%

Procedure

A- Preparatory Phase:

- Conducted following a review of the literature about the theoretical understanding of many study-related components using books, papers, journals on the internet, and magazines to create the data collection tool.

B-Tools Validity:

The tools were reviewed for clarity, relevance, comprehensiveness, understandability, and applicability by a jury of five experts from the fields of medicine and medical surgical nursing, and internal medicine (cardiovascular physicians), and any necessary modifications were made following their recommendations.

Reliability:

- The Cronbach's alpha coefficient is used to evaluate the internal consistency of tools. For the nurses' knowledge questionnaire, the value was (0.954), for the nurses' observational checklist, the value for practice was (0.982), for the nurses' attitude, the value was (0.922), and for the coaching practice scale, the value was (0.78).

Pilot study

10% of the total number of nurses participates in pilot research. The purpose of the pilot study was to evaluate the viability of the study tool and the quote to preserve consistency as well as its application, clarity, and relevance. The time required to complete the tools was also estimated using this method. The evolved final form was not altered in any way. The study's final subjects include the nurses who participated in the pilot.

Ethical Considerations:

- To participate in the study, the nurses gave their consent to the researcher. The participant-researcher interaction covered the study's purpose and goals. The participant's anonymity and confidentiality were protected, thanks to the researcher's efforts. The option to participate or not, as well as the freedom to leave the study at any moment without consequence, are both granted to participants.

Difficulties of the study:

The following challenges faced the researcher as she carried out this study: - Not all of the nurses who were being researched were available at the same time, therefore the researcher had to work morning and afternoon shifts to be able to obtain them all.

- Due to the nurses' intense workload, the researcher had to remain in the area for an extended period, often until late at night.

Field of work

The study was conducted during the period from the beginning of January -2022 to the end of June - 2022. The study data collection enrolled through three phases:

Firstly, pre- intervention phase; after receiving the approval, the researchers explained the objectives and points of the study tools to all nurses. Before the coaching program was put into place, the researchers started by conducting individual interviews with each nurse, these interviews lasted 20 to 30 minutes, and the purpose of them was to evaluate each nurse's knowledge, attitude, and practice concerning the care of patients undergoing cardiac catheterization. Using the nurses' answers, the coaching score was recorded. The pre-test data collection instruments comprised information on the traits of nurses, their knowledge (tools I), and attitude (tools II). In terms of attitude, nurses in (morning and afternoon shifts) were given a scale, and they handled them independently. The researcher observed each nurse as she provided care to patients before, during, and following cardiac catheterization. Coaching techniques were evaluated using (tools III) practice related to patient care for cardiac catheterization (tools IV).

Secondly, in the coaching program application:

1. At this point, researchers employ the GROW modeling method (**Whitmore, 2002**). The GROW model of coaching strategy is the most popular (Goal, Reality, Options, Will). The GROW model uses a cooperative problem-solving procedure that entails determining the source of the issue, coming up with a solution, and putting it into practice. This model is regarded as a straightforward and practical method that focuses on coaches' actions as they assist clients in reaching their objectives and resolving issues during the coaching process. There are four stages:

2. G for Goal: The goal should be as clearly defined as possible because it represents what the nurses hope to accomplish.

3. At this point, R for Reality nurses describe the situation as it is and how far they are from their objectives.

4. What barriers (O for obstacles) stand in the way of nurses reaching the objective? Once these obstacles are recognized, the helper can discover solutions and ways to get around them.
5. W for will to go forward: After options are chosen, nurses must put them into practice to complete the task.
6. All nurses in the intervention group participated in the coaching program, which had 8 coaching sessions in total. These sessions may be conducted over the phone or one-on-one.

The first coaching session was based on a subject that the nurses either didn't comprehend or didn't have enough information about. Before the start of education on a specific topic in caring for patients undergoing cardiac catheter, the researchers established and confirmed detailed goals the subjects wanted to achieve in each subject in phase G (goal setting), such as a definition, purpose, investigations, complications, and precautions of cardiac catheterization, preparation of patient and nursing management of a patient undergoing cardiac catheter, nurses' knowledge regarding cardiac catheterization, nurses' knowledge of post-cardiac catheterization patient care, nurses' knowledge of cardiac catheterization patient care (health education), identify coaching in nursing, etc.

Through the use of framing questions, the researchers determined the challenges and impediments to the actual application of the theme of "care intervention recommendations for patients with cardiac catheterization" in the R (Reality) stage. The researchers developed coaching sessions based on the needs of participants and the most recent recommendations for the care of patients having cardiac catheterization in the O (options) stage to drive education by discussing what to know and do about each item of the program. The researchers validated the material and urged participants to confidently practice coaching in the workplace during the last stage of W (will).

No ready-made solutions are offered by the coach during the coaching process. While the coach supports the participant throughout the entire process by paying close attention to what they have to say and by posing open-ended questions that will assist the participant to determine the most effective strategy for achieving the desired outcome in light of their available resources. The coaching sessions enabled the participants to be made more aware, to ask questions, and to be given activities that would help them see a situation differently.

To help nurses develop their knowledge, attitude, and practice, the researchers offer training sessions. The information about CHD, cardiac catheterization indications, problems, patient health education, pre-, and post-CC family care procedures, and nursing care for cardiac catheterization patients comprised the bulk of the training's subject matter. Sessions on coaching methodology are also available. Numerous formats, including in-person meetings, are used for the coaching sessions. The coaching subjects included managing and emphasizing patient care, nurses' resources, and values. Some examples of coaching topics were professional development in the treatment of patients undergoing cardiac catheterization.

The final phase, program evaluation (post coaching): The researchers start to assess the

instruction after each session of the coaching program. Gain priceless insights by using ongoing feedback. Nurses also supported work habits in a coaching session and offered a worksheet and/or action item. The nurses utilize the same pre-test tools on each of the surveys they complete along the way. The post-evaluation after the eight coaching sessions put the participants' practices to the test.

Results:

Table (1): Frequency and percentage distribution of studied nurses Sociodemographic Characteristics (n=50)

Sociodemographic characteristics	N	%
Sex:		
Male	15	30.0
Female	35	70.0
Age		
20 > 30	23	46.0
30 > 40	20	40.0
40 > 50	5	10.0
≥50	2	4.0
Level of education		
Nursing diploma	12	24.0
Nursing technical institute	17	34.0
Health technical institute	8	16.0
Bachelor of Nursing	13	26.0
years of Experience		
1 <5	16	32.0
5 <10	20	40.0
≥10	14	28.0
Attending Training courses		
No	7	14.0
Yes	43	86.0
Presence of protocol for cardiac catheter unit		
No	0	0.0
Yes	50	100.0

Table (1): reveals that 46% of the nurses were between the ages of 20 and 30 and that 70% of the nurses in the study were female. In terms of education, it was found that approximately (34%) of the nurses who participated in the study attended a nursing technical institute. The same table also shows that (40%) of the nurses in the study reported having experience of five to ten years

or less. In terms of attending training courses, (86%) of the nurses who participated in the study reported doing so. All of the nurses that participated in the study (100%) indicated that the cardiac catheter unit has a protocol in place.

Table (2): Percentage distribution of the nurses' knowledge's level score regarding the care of patients undergoing cardiaccatheterization pre-post coaching program (n=50).

Nurses' knowledge of cardiac catheterization	Pre-coaching program				Post-coaching program				P – value
	Unsatisfactory (<75%)		Satisfactory (≥75%)		Unsatisfactory (<75%)		Satisfactory (≥75%)		
	No.	%	No.	%	No.	%	No.	%	
Nurses' knowledge regarding cardiac catheterization	20	40.0	30	60.0	5	10.0	45	90.0	.001*
Nurses' knowledge regarding the care of patients before cardiac catheterization	35	70.0	15	30.0	4	8.0	46	92.0	.001*
Nurses' knowledge regarding the care of patients during cardiac catheterization	35	70.0	15	30.0	3	6.0	47	94.0	.001*
Nurses' knowledge regarding the care of patients after cardiac catheterization	18	36.0	37	64.0	4	8.0	46	92.0	.001*
Nurses' knowledge regarding health education of patients' undergoing cardiac catheterization	29	58.0	21	42.0	6	12.0	44	88.0	.001*

Chi-square test was used; highly significant at < .001;

Table (2): demonstrates how the nurses under study were distributed according to their level of expertise in providing care for patients undergoing cardiac catheterization before and after coaching. As shown in the table, 70% of the nurses who were part of the study had knowledge gaps both before and during a cardiac catheterization pre-coaching program also, after the coaching program. According to the findings, the majority of them had a sufficient degree of knowledge about cardiac catheterization in terms of all components that occurred before, during, and following cardiac catheterization. Between the pre- and post-coaching program intervention, there were substantial differences in the post-knowledge score (p< 0.001).

Table (3): Percentage distribution of the nurses' knowledge's level score regarding nursing coaching pre-post coaching program (n=50).

Nurses' knowledge's regarding nursing coaching	Pre-coaching program				Post-coaching program				P – value
	Unsatisfactory (<75%)		Satisfactory (≥75%)		Unsatisfactory (<75%)		Satisfactory (≥75%)		
	No.	%	No.	%	No.	%	No.	%	
Coaching definition	40	80.0	10	20.0	3	6.0	47	94.0	.000*
Nursing coaching	30	70.0	15	30.0	4	8.0	46	92.0	.000*
Steps of coaching	34	68.0	6	32.0	5	10.0	45	90.0	.000*
Effective coaching in nursing practice	32	64.0	3	26.0	4	8.0	46	92.0	.000*
Benefit of coaching	36	72.0	4	28.0	0	0.0	50	100.0	.000*

The Chi-square test was used; highly significant at < .001

Table (3): demonstrates that there was a substantial difference in nurses' knowledge of nursing coaching after using the coaching program; the level of knowledge scores was significantly lower before the intervention of the coaching program than after the coaching program intervention ($p < .000$).

Table (4): Percentage distribution of the total nurses' attitudes level regarding the care of patients undergoing cardiaccatheterization pre-post coaching program (n=50).

Nurses' attitudes	Pre-coaching program				Post-coaching program				P – value
	Positive (<75%)		Negative (≥75%)		Positive (<75%)		Negative (≥75%)		
	No.	%	No.	%	No.	%	No.	%	
Nurses' attitude regarding the care of patients undergoing cardiac catheterization	15	30.0	35	70.0	7	14.0	43	86.0	.000*

Table (4): distributes the nurses under study according to their attitude. In the pre-coaching

program, slightly less than one-third of the nurses in the study (30%) had a negative attitude toward the item "total nurses' attitude regarding the care of patients undergoing cardiac catheterization," whereas slightly more than eight in ten (86%) of them had a positive attitude toward the same item post-coaching program.

Table (5): Percentage distribution of the nurses' practices level score regarding the care of patients undergoing cardiaccatheterization pre-post coaching program (n=50).

Nurses' practices regarding nursing coaching	Pre-coaching program				Post-coaching program				P – value
	Incompetent (<75%)		Competent (≥75%)		Incompetent (<75%)		Competent (≥75%)		
	No.	%	No.	%	No.	%	No.	%	
•Nurses' practice regarding the care of patients before cardiac catheterization	18	36.0	32	64.0	5	10.0	45	90.0	.000*
•Nurses' practice regarding the care of patients during cardiac catheterization	13	26.0	37	74.0	4	8.0	46	92.0	.000*
•Nurses' practice regarding the care of patients after cardiac catheterization	21	42.0	29	58.0	3	6.0	47	94.0	.000*
•Nurses' practice regarding the care of patients post discharge orders	24	48.0	26	52.0	6	12.0	44	88.0	.000*

The Chi-square test was used; highly significant at < .001

Table (5): Indicates the distribution of the studied nurses according to their level of practice. As observed in the table, there was a significant difference concerning nurses' practice after applying for the coaching program regarding cardiac catheterization.

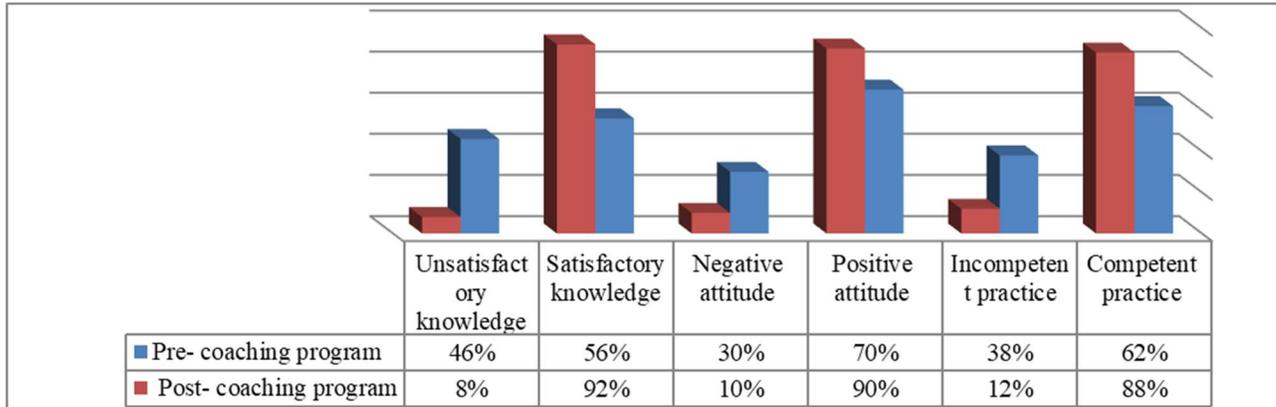


Figure (1): Total nurses' knowledge's, attitudes, and practices regarding care of patients undergoing cardiac catheterization pre-post coaching program (n=50).

Figure (1): Clarifies that there were significant differences and improvements concerning nurses' knowledge, attitude, and practice after applying for the coaching program regarding cardiac catheterization.

Table (6): Correlations between total nurses' knowledge's, practices, and attitudes scores regarding the care of patients undergoing cardiac catheterization pre-post coaching program

			Pre-coaching program			Post-coaching program		
			K	A	P	K	A	P
Pre-program	Knowledge's (K)	R	1					
		P- value						
	Attitudes (A)	R	0.627	1				
		P value	0.0001**					
	Practices(P)	R	0.265	0.347	1			
		P value	0.026*	0.003**				
Post-program	Knowledge's	R	0.383	0.182	0.219	1		
		P value	0.001**	0.137	0.072			
	Attitudes	R	0.338	0.368	0.024	0.382	1	
		P value	0.004**	0.002**	0.835	0.001**		
	Practices	R	0.365	0.096-	0.122	0.093	0.053-	
						0.375		

		P value	0.002**	0.424	0.318	0.448	0.677	0.003*
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*Correlation is significant at the 0.05 level

**Correlation is significant at the 0.01 level

Table (7): demonstrates that there is a fair positive correlation between the knowledge scores of the studied sample and their practice scores before coaching ($r= 0.265$, P value < 0.0001), a moderate positive correlation between knowledge and practice scores before coaching ($r= 0.627$, P value 0.0001), and a strong positive correlation between attitude and practice scores before coaching ($r= 0.347$, P value < 0.0003). Additionally, there was a significant link between the knowledge of the examined sample before the coaching program and their knowledge, attitude, and practice scores after the coaching program ($r= 0.383$, P value 0.001 ; $r= 0.338$, P value < 0.004 ; and $r= 0.365$, P value < 0.002 , respectively). Positive correlation between the attitude of the studied sample pre-coaching program and their attitude post-program ($r= 0.368$, P value < 0.002) and positive correlation between knowledge of the studied sample post-coaching program and their attitude post-coaching program ($r= 0.382$, P value < 0.001).

Discussion:

Cardiac catheterization is described as a procedure used in cardiovascular diseases for diagnosis and treatment, during which a long, thin tube known as a catheter is inserted into an artery or vein in the groin, neck, or arm and threaded through blood vessels to the heart (Ksztacenia et al., 2018). By enrolling in specialized training, specialization, and qualification program based on educational program, nurses can continue to advance their careers (European Federation of Nurses Associations, 2018).

Nursing coaching is described as a collaborative connection between the nursing supervisor and the nurses that strives to enhance the nurses' abilities and knowledge concerning the performance standards for the position (Batson & Yoder., 2012). It is thought to be a crucial characteristic that healthcare companies must promote in nurses' administrators to advance the nursing staff and achieve a high degree of commitment (Pousa, 2014; Steelman & Wolfeld., 2018).

Nurses can receive support from clinical coaching in a range of circumstances. It facilitates the nurse's ability to give feedback, establish goals, and track their progress (Kabeel, 2016). The practice of coaching in the nursing industry is still essential for the growth of nurses as well as for the organization (Bleich, 2016). Therefore this study was done to evaluate the effect of the coaching program on nurses' nurses' performance regarding caring for patients undergoing cardiac catheterization.

According to the findings of the current study, less than half of nurses were female and between the ages of 20 and 30. Nearly three-quarters of nurses were also female. This might be a result of the majority of the nurses in the poll being under 30. These results were in line with those of

Bakhet., (2017), who examined nurses' assessments of patient safety during cardiac catheterization at the Sudan cardiac center and discovered that half of the participants had work experience ranging from more than five years to less than ten years. Furthermore, it was revealed by **Hasballah et al., (2019)** that more than half of the nurses employed in the cardiac catheterization unit had experienced less than five years.

According to the findings of the current study, almost one-third of the nurses who were subjected to the study attended a nursing technical institute. This finding was corroborated by **Thabet et al., (2019)**, who investigated the effect of developing and implementing standards of care on the outcomes of patients undergoing cardiac catheterization and discovered that while nurses in the study group had nursing diplomas, more than two-fifths of the nurses in the control group had technical nursing institute degrees.

Regarding years of experience, it was noted that two-fifths of the nurses who participated in the study had experience ranging from 5 to fewer than 10 years. This may be because the majority of the nurses who participated in the study were juniors. These findings were in line with **Mohammed & Elsisi's (2018)** study on nurses' knowledge and practice in administering total parenteral nutrition in critical care units in Egypt. In that study, it was found that fewer than half of the analyzed sample had between five and ten years' worth of expertise.

According to the findings of the current study, the majority of the nurses who were subjected to it had taken a cardiac catheterization training course. The findings of **Sameen, (2018)** who discovered that the majority of the study subjects had not had any cardiac catheterization training differed from this outcome. In the control group, more than half of the nurses indicated taking cardiac catheterization training classes. This might be explained by their hospital's emphasis on cardiac catheterization-related courses. The findings of **Abo El-ata et al., (2020)**, who discovered that the majority of the study group stated attending courses about cardiac catheterization training, do not support this conclusion.

This finding contrasts with the findings of a study by **Tangiisuran et al., (2017)** on nurses' and general caregivers' knowledge, attitudes, and practices regarding the administration of medications (comparison study), which found that approximately three-quarters of the study group had not participated in any training sessions or courses regarding anti-coagulant drugs.

The study's findings regarding the nurses' knowledge showed that over three-quarters of the nurses had insufficient levels of knowledge before and during the cardiac catheterization pre-coaching program. This can be because they don't know enough about how to prepare patients for cardiac catheterization. In addition to having too much work, nurses who have worked in intensive care units for a while lack the motivation to learn more, and they need to update their understanding of serious health issues. More than half of the nurses were found to have an inadequate

understanding of patient safety during cardiac catheterization, according to a study by **Feroze et al., (2017)**.

According to the results of the current study, the absence of ongoing supervision, evaluation, and collaboration among diverse members of the healthcare team may be a contributing factor in nurses' lack of knowledge regarding the care of patients having cardiac catheterization (nurses-physicians). A study by **Degavi (2013)** on staff nurses working at the ICCU of the Heart Foundation of KLEs regarding the usefulness of planned teaching program on knowledge of cardiac rehabilitation supports the researcher's viewpoints. The results of the posttest on nurses' knowledge were excellent; however, almost half of the studied group had low knowledge on the pretest.

The study's findings showed that in the post-coaching program, the nurses' knowledge levels were higher. The findings demonstrate that the majority of them had adequate levels of knowledge about cardiac catheterization before, during, and after a cardiac catheterization, with significant variations in post-knowledge scores between pre and post-coaching program intervention. This outcome may be explained by the fact that the coaching program assisted nurses in expanding their knowledge of cardiac catheterization and keeping it up to date. This result was consistent with those **Mohamed & Elsisi., (2018)**, who reported that more than two-thirds of nurses had a good level of awareness of the risks and complications associated with cardiac catheterization following the implementation of the program. This outcome was consistent with what **Wondimu, (2022)** discovered, which is that nurses' knowledge of cardiac catheterization has significantly improved.

According to the results of the current study, there was a significant difference between pre-coaching program knowledge scores and post-coaching program intervention knowledge scores regarding nurses' understanding of nursing coaching. This conclusion can be highlighted by the fact that nurses did not receive a coaching program from their employer to support their function as coaches to satisfy the expectations they are coaching. These results were consistent with those of **Eid & Abou Ramadan, (2020)**, who investigated the impact of a coaching education program for head nurses on nurses' self-efficacy and discovered that, before the program, all head nurses had low levels of overall and cross-cutting coaching expertise.

This finding may be explained by the fact that coaching program can assist nurses in learning the fundamentals of nursing coaching and that they were successfully able to learn about new nursing approaches as a result. Additionally, nurses were more eager to learn about coaching in the clinical setting. This outcome was consistent with **Elnagar et al., (2020)**, who claimed that all examined nurses had improved their coaching knowledge following the training. Additionally, **Abdalla et al., (2022)** discovered that after the program's execution, more than two-thirds of the participants in the study had satisfactory levels of coaching expertise.

According to the study's overall results on nurses' attitudes toward the care of patients undergoing cardiac catheterization, the majority of the nurses under investigation had good attitudes following the coaching program. This might be a result of the fact that more than half of the nurses in the study had solid training, protocol knowledge in the cardiac unit, and years of experience caring for cardiac patients having cardiac catheterization.

Feroze et al., (2017) and others support this viewpoint, Additionally, this outcome is consistent with **Cross et al., (2017)** 's study on nurses' perceptions toward single medication checks who made noticed the fact that the majority of the nurses who participated in the study had a favorable attitude about a single medication check after a cardiac catheterization treatment.

Following the implementation of the coaching program for cardiac catheterization, the study's findings revealed a considerable difference in nurses' practices. This may be because nurses' practices are directly influenced by their knowledge, which also serves as the foundation for practice and is necessary to reach optimal practices. This study supports **Ammentorp & Kofoed., (2010)** who looked at how coach training affected neonatal nurses' self-efficacy. In their pilot study, they found that coaching is a process that promotes personal growth and gives trainees knowledge and skills to help them realize their full potential. The continuous feedback offered for each measurement in this coaching program, they continued, may have aided in the confidence-building and skill-acquisition of nurses.

This finding was corroborated by **Henedy & El-Sayed., (2019)**, who discovered that more than half of the nurses under study had experienced cardiac catheterization at a skilled level. This conclusion may be attributable to the coaching technique's value as a staff development tool that can assist nurses to grow their potential and practice. This finding was in line with that of **Mohamed & Elsis., (2018)**, who discovered that the vast majority of the studied nurses performed well after program intervention.

Based on the research's findings, the study's findings showed that nurses' knowledge, attitudes, and practices about cardiac catheterization significantly changed and improved after using the coaching program. This showed the beneficial outcomes of the coaching program intervention.

According to the study's conclusions, there were statistically significant relationships between the overall scores of nurses' knowledge, practice, and attitude toward caring for patients undergoing cardiac catheterization. The fact that more than half of the sample under study had sufficient levels of knowledge and practice and that the majority of them exhibited a favorable attitude toward the care of patients having cardiac catheterization may be the cause of these results. The prevention of unfavorable nursing outcomes is also thought to be possible through training. Nurses must therefore possess the necessary information that they have applied in practice to deliver high-quality care. In keeping with this finding, a study conducted by **Ali (2015)** discovered

a significant association between the overall score of Egyptian nurses' knowledge and practice.

Conclusion

Based on the results of the present study, the study concluded that the coaching program improved nurses' performance concerning care for patients undergoing cardiac catheterization and improved their coaching skills.

Recommendations:

After the conclusion of the present study, many recommendations can be suggested:

- 1- The coaching program for nurses should be applied continuously to help them become better coaches and performers when caring for patients having cardiac catheterization.
- 2- It is crucial to educate nurses on cardiac catheterization standards of care through the in-service training program.
- 3- Ongoing assessment of nurses' knowledge, skills, and attitudes is crucial to determining what they need to do to remedy the problem.
- 4- Encourage and assist nurses in attending national and international conferences, workshops, and training sessions connected to the Ministry of Health that focus on providing nursing care for patients having cardiac catheterization.

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